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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,766	12/11/2001	Christos Dimitrios Dimitrakopoulos	YOR920010283US2	9469
7590	05/06/2004			
Alvin J. Riddles Box 34, Candlewood Isle, New Fairfield, CT 06812			EXAMINER KIELIN, ERIK J	
			ART UNIT 2813	PAPER NUMBER

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/014,766

Applicant(s)

DIMITRAKOPOULOS ET AL.

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-12 is/are pending in the application.
- 4a) Of the above claim(s) 6-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This action responds to the Amendment filed 15 April 2003 and the Response filed 10 March 2004.

Claim Status

Claims 1-5 are canceled. Claims 6-9 are withdrawn from further consideration. Claims 10-12 are newly added and will be examined.

Drawings

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). (See specification p. 3, lines 3-5.)

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. **The objection to the drawings will not be held in abeyance.**

This rejection is repeated from the Office action filed 7 January 2003. Applicant is respectfully advised to consider the admitted prior art presented in the several IDSs and the admissions in the specification --especially at pages 3-6-- before making additional arguments that Figs. 1 and 2 are not admitted prior art.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the article Struijk et al. "Liquid Crystalline Perylene Diimides: Architecture and Charge Carrier Mobilities" Journal of the American Chemical Society 2000, 122, pp. 11057-11066 (article provided by Applicant) in view of US 6,387,727 B1 (Katz et al.).

Regarding claim 1, Struijk discloses an organic thin film semiconductor device wherein there is an n-channel having contacts separated by said n-channel, the improvement wherein said organic thin film is of a N,N"-di(n-1H, 1H-alkyl) perylene 3,4,9,10- tetracarboxylic acid diimide. (See Fig. 1, p. 11058; paragraph bridging pp. 11065 and 11066; last paragraph of left-hand col. of p. 11066.) Note in pertinent part that n-channel character of the perylene compound is indicated and that the use is contemplated for FET (field effect transistors) which inherently have a channel separated by electrodes contacting the organic semiconductor layer.

Although Struijk does not indicate if the interface between said contacts and the perylene compound thin film is ~~not~~ treated, this limitation is not considered to have patentable weight. Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or

not. Note that applicant has the burden of proof in such cases, as the above case law make clear.
(See MPEP 2113.)

The prior art of **Struijk**, as explained above, discloses each of the claimed features except that the alkyl is perfluorooctyl, thereby giving N,N"-di(n-1H, 1 H-perfluorooctyl) perylene 3,4,9,10- tetracarboxylic acid diimide.

Katz also teaches a thin film transistor (cover Fig.) wherein the n-channel organic semiconductor 20 compounds are "formed from fused-ring tetracarboxylic diimide[s]" (Abstract). Source/drain electrodes 10 and 12 are also shown in contact with 20. **Katz** indicates that "[u]seful chains having such fluoro substituents include 1H,1H-perfluorooctyl" attached to the imide nitrogen. (Emphasis added.) **Katz** indicates that such fluoro groups are typically and beneficially used to fill in the space of the crystal lattice of the organic semiconductor film of the transistor to prevent oxygen permeability. (See col. 5, lines 29-65.)

It would have been obvious for one of ordinary skill in the art, at the time of the invention to modify the imide substituent of the perylene compound of **Struijk** to use the 1H,1H-perfluorooctyl group, in order to beneficially reduce the oxygen permeability into the perylene semiconductor film of the transistor, as taught by **Katz**.

2. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Struijk** in view of **Katz** as applied to claim 10 above, and further in view of Applicant's admitted prior art (APA).

The prior art of **Struijk** in view of **Katz**, as explained above, discloses each of the claimed features except for the configuration of the thin film transistor.

APA specification states on p. 3,

“Referring to Figs. 1 and 2. The illustrated devices are cross-sectional views of **typical organic thin film transistors**, wherein in Fig. 1 is a bottom contact configuration is illustrated and in Fig. 2 a top contact configuration is illustrated.” (Emphasis added.)

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use the transistor configurations of APA as the configuration in **Struijk**, as a matter of design choice since **Struijk** is silent to the configuration such that one of ordinary skill would be motivated to use known configurations which would thereby save time and money in research and development, re-inventing something that is already known to work.

3. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Struijk** in view of **Katz** as applied to claim 10 above, and further in view of US 6,278,127 B1 (**Dodabalapur et al.**).

The prior art of **Struijk** in view of **Katz**, as explained above, discloses each of the claimed features except for the configuration of the thin film transistor.

The prior art Fig. 1 of **Dodabalapur** and the Figs. 2-4 show the claimed transistor configuration and is the same as shown in Figs. 1 and 2 of the instant application. **Dodabalapur** also indicates that the organic semiconductor material can be perlene tetracarboxylic acid diimides.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use the transistor configurations of **Dodabalapur** as the transistor configuration of **Struijk** because **Struijk** is silent to the configuration such that one of ordinary skill would be motivated

to use known configurations which would thereby save time and money in research and development, re-inventing something that is already known to work.

Response to Arguments

4. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin
Primary Examiner
5 May 2004